FCC Information and Copyright

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PACKAGE CHECKLIST

- λ FDD Cable x 1
- λ HDD Cable x 1
- λ User's Manual x 1
- λ Overclock Guide x 1
- λ Serial ATA Cable x 2
- λ Fully Setup Driver CD x 1
- λ Rear I/O Panel for ATX Case x 1
- λ SPDIF Cable x 1 (optional)
- λ USB 2.0 Cable x 1 (optional)
- λ IEEE 1394A Cable x 1 (optional)

PACKAGE CHECKLIST ..... *I*

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Chapter 1: Introduction

1.1 MOTHERBOARD FEATURES

CPU

- λ Supports Socket 939.
- λ Supports AMD Athlon 64 FX / Athlon 64 /Athlon 64 X2 processors.
- λ Supports AMD Sempron processor.
- λ AMD 64 architecture enables simultaneous 32 and 64 bit computing.
- λ Supports HyperTransport and AMD Cool'n'Quiet Technology.

Chipset

- λ NVIDIA nForce4 for TForce4.
- λ NVIDIA nForce4 Ultra for TForce4 Ultra.
- λ Both support:
  - Supports NVIDIA Firewall.
  - Supports Gigabit Ethernet.
  - Supports NVIDIA nTune Utility.
  - Supports NVIDIA Secure Networking Processor.

Operating Systems

- λ Supports Windows 2000 and Windows XP.
  Note: *Does not support Windows 98SE and Windows ME.*

Dimensions

- λ ATX Form Factor: 23.4cm (W) x 29.35cm (L)

Main Memory

- λ Supports Dual Channel DDR.
- λ Supports DDR333 and DDR400.
- λ Maximum memory space is 4GB, supporting 4 DIMM sockets.

Serial ATA

- λ nForce4 Ultra supports SATA 2.0 specification, with data transfer rates up to 3Gb/s.
- λ nForce4 supports SATA 1.0 specification, with data transfer rates up to 1.5Gb/s.

Super I/O

- λ Chip: ITE IT8712F.
- λ Environment Control initiatives,
  - H/W Monitor
  - Fan Speed Controller
  - ITE's "Smart Guardian" function

IDE

- λ 2 on-board connectors support 4 IDE disk drives.
- λ Supports PIO mode 5, Block Mode and Ultra DMA 33/66/100/133 bus master mode.

AC'97 Audio Sound Codec

- λ Chip: ALC850, supports 8 channels audio output.

IEEE 1394A Chip

- λ Chip: VIA VT6307, supports 2 ports with transfer up to 400Mb/s.

Gigabit Ethernet LAN

- λ NVIDIA Gigabit MAC + VITESSE Gigabit PHY VSC8201.
- λ Supports ACPI power management.
- λ Supports NVIDIA StreamThru technology
  - Isochronous controller paired with Hyper Transport results in fastest networking performance

Security

- λ NVIDIA Firewall technology
  - Native firewall solution protects the PC from intruders by filtering unauthorized traffic.
- λ NVIDIA Active Armor (Only for nForce4 Ultra)
  - Enhances network security, and provides users with an environment both fast and secure.

NVIDIA RAID Technology

- λ RAID 0 disk striping for highest system and application performance
- λ RAID 1 disk mirroring support for fault tolerance
  Support for both SATA and ATA-133 disk controller standards
- λ RAID 0+1 disk striping and mirroring for highest performance with fault tolerance

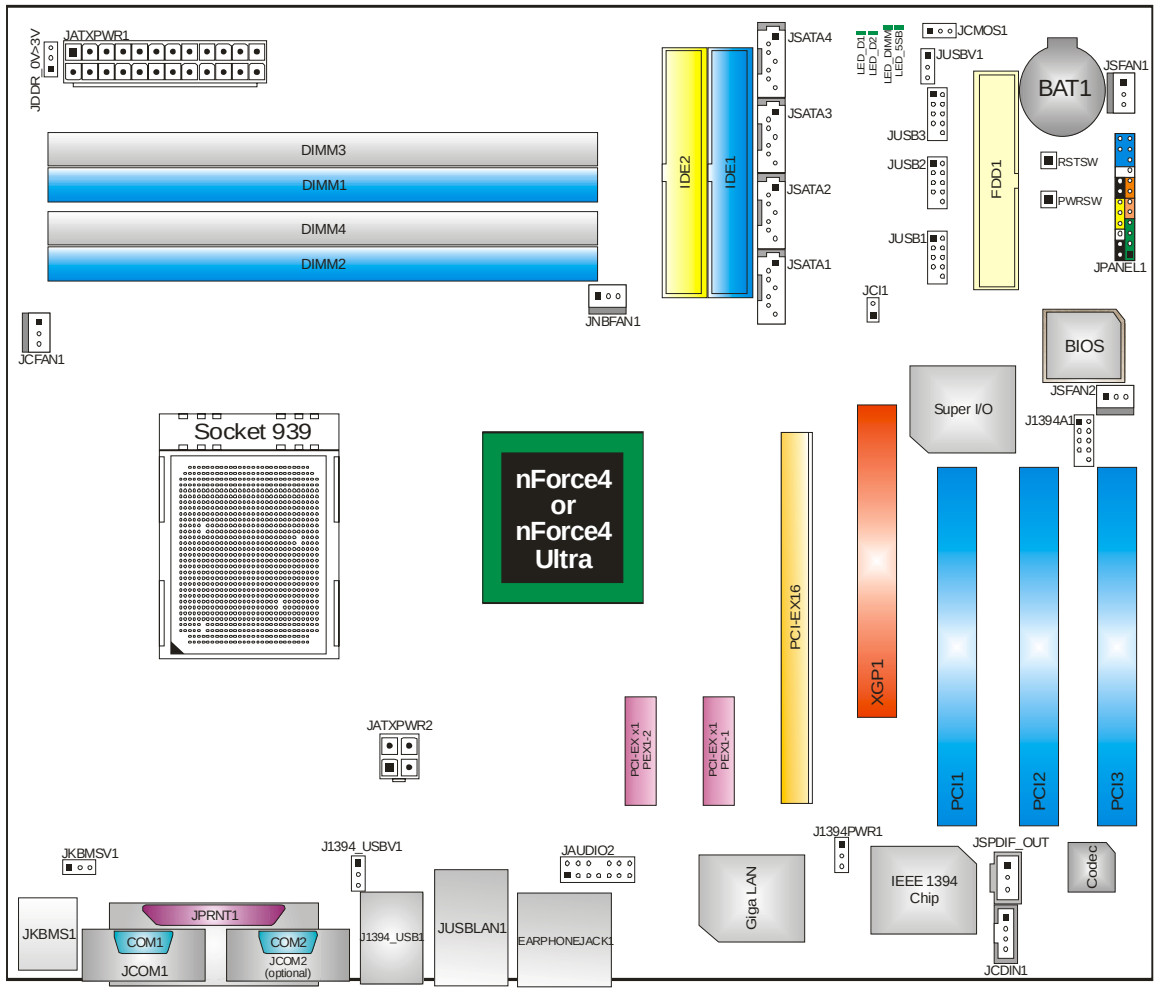
Internal On-board Slots and Connectors

- λ One PCI-Express X16 slot.
- λ One Xtreme Graphics slot.
- λ One SPDIF-Out connector.
- λ One CD-ROM audio-in connector.
- λ Two PCI-Express X1 slots.
- λ Two Ultra DMA 133/100/66/33 IDE connectors.
- λ Three PCI slots.
- λ Four SATA ports.

Back Panel I/O Connectors and Ports

- λ 1 Printer Port.
- λ 1 RJ-45 LAN jack.
- λ 1 PS/2 Mouse Port.
- λ 1 PS/2 Keyboard Port.
- λ 1 1394A Firewire Port.
- λ 1 Serial Port. (COM2 is optional.)
- λ 4 USB 2.0 Ports.
- λ 6 audio ports support 8 channels audio-out facilities.

1.2 LAYOUT AND COMPONENTS



Note: ■ represents the 1st pin.

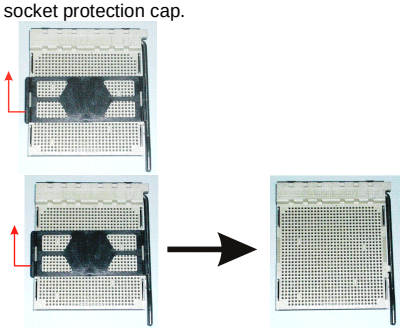
Chapter 2: Hardware Installations

2.1 CPU Assembly

A. Central Processing Unit (CPU)

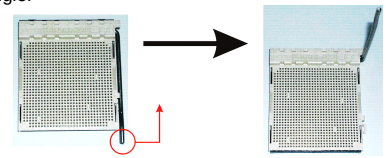
Step 1:

Remove the socket protection cap.



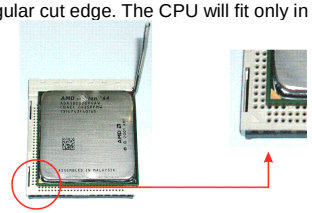
Step 2:

Pull the socket locking lever out from the socket and then raise the lever up to a 90-degree angle.



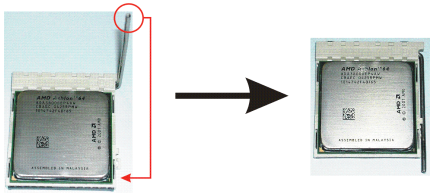
Step 3:

Look for the triangular cut edge on socket, and the golden dot on CPU should point towards this triangular cut edge. The CPU will fit only in the correct orientation.



Step 4:

Hold the CPU down firmly, and then lower the lever to locked position to complete the installation.



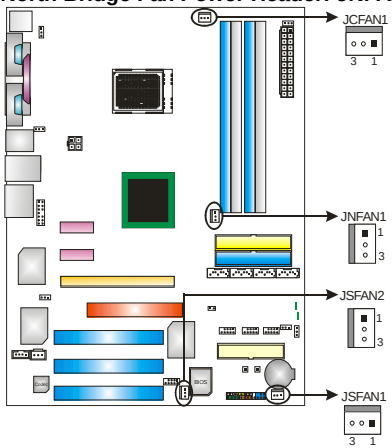
Step 5: Put the CPU Fan and heatsink assembly on the CPU and buckle it on the retention frame. Connect the CPU FAN power cable into the JCFAN1. This completes the installation.

B. About FAN Headers

CPU FAN Power Header: JCFAN1

System Fan Power Headers: JSFAN1/JSFAN2

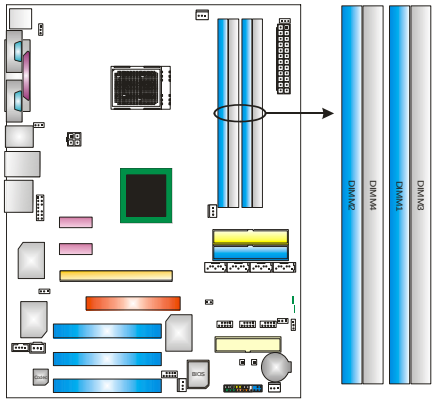
North Bridge Fan Power Header: JNFAN1



Pin	Assignment
1	Ground
2	+12V
3	FAN RPM rate sense (Does not support JSFAN2.)

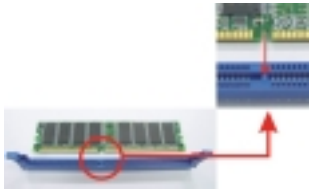
Note:
JCFAN1and JNFAN1 support system cooling fan with Smart Fan Control utilities. It supports 3 pin head connector. When connecting with wires onto connectors, please note that the red wire is the positive and should be connected to pin#2, and the black wire is Ground and should be connected to GND.

2.2 SYSTEM MEMORY

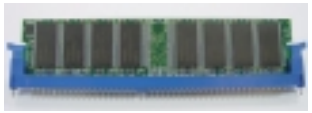


A. DDR Modules

1. Unlock a DIMM slot by pressing the retaining clips outward. Align a DIMM on the slot such that the notch on the DIMM matches the break on the slot.



2. Insert the DIMM vertically and firmly into the slot until the retaining chip snaps back in place and the DIMM is properly seated.



Notes:
To remove the DDR modules, push the ejector tabs at both sides of the slot outward at the same time, and pull the modules out vertically.

B. Memory Space

DIMM Socket Location	DDR Module	Total Memory Size (MB)
DIMM1	128MB/256MB/512MB/1GB *1	Max is 4 GB.
DIMM2	128MB/256MB/512MB/1GB *1	
DIMM3	128MB/256MB/512MB/1GB *1	
DIMM4	128MB/256MB/512MB/1GB *1	

C. DDR Installation Notice

- λ Please follow the table below to install your DDR memory module, or the system may not boot up or may not function properly.
- λ "SS" represents Single Side DDR memory module.
- λ "DS" represents Double Side DDR memory module.
- λ Star sign "*" represents leave the DIMM socket empty.

DIMM1	SS/DS	*	SS/DS	*	SS/DS
DIMM2	*	*	SS/DS	*	SS/DS
DIMM3	*	SS/DS	*	SS/DS	SS/DS
DIMM4	*	*	*	SS/DS	SS/DS

D. Special Notice

For AMD K8 939 CPU launched before Rev. E, (see the table below to know your CPU version) please follow the table below to install your DDR memory module, or the system may not boot up or may not function properly.

Know your CPU version …

AMD Athlon™ 64 Processor Ordering Part Number Example

ADA 3200 A E P 5 AP

Part Definition: AP = Rev C0 (see Table 1)

AMD Athlon™ 64 Processor Part Definition

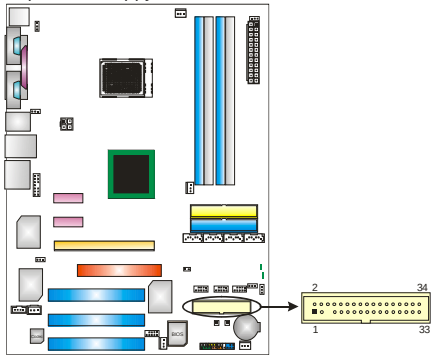
Part Definition	Revision	Part Definition	Revision
AP	Rev C0	BN	Rev E4
AR	Rev CG	BP	Rev E3
AS	Rev CG	BO	Rev E3
AW	Rev CG	BY	Rev E6
AX	Rev CG	BW	Rev E6
AZ	Rev CG		
BI	Rev D0		

2.3 PERIPHERALS

A. Card and I/O Slots:

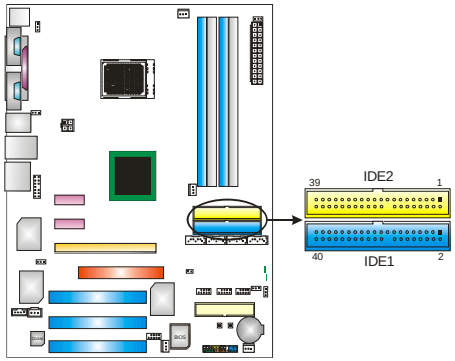
Floppy Disk Connector: FDD1

The motherboard provides a standard floppy disk connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types. This connector supports the provided floppy drive ribbon cables.



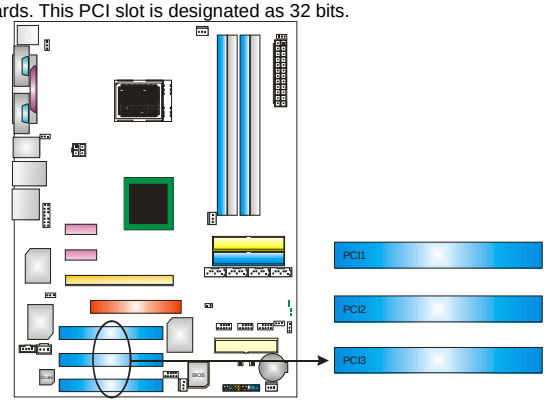
Hard Disk Connectors: IDE1/IDE2

The motherboard has two 32-bit Enhanced PCI IDE Controllers that provide PIO Mode 0~5, Bus Master, and Ultra DMA 33/66/100/133 functionality. It has two HDD connectors IDE1 (primary) and IDE2 (secondary). The IDE connectors can connect a master and a slave drive, so you can connect up to four hard disk drives. The first hard drive should always be connected to IDE1.



Peripheral Component Interconnect Slots: PCI1~PCI3

This motherboard is equipped with 3 standard PCI slots. PCI stands for Peripheral Component Interconnect, and it is a bus standard for expansion cards. This PCI slot is designated as 32 bits.



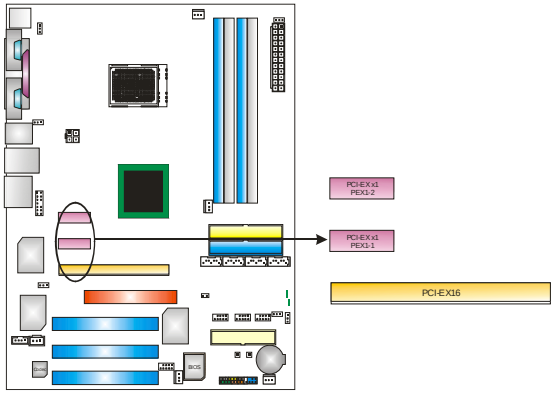
PCI-Express Slots

PCI-EX16:

- PCI Express 1.0a compliant.
- Maximum bandwidth is up to 4GB/s per direction.

PEX1-1/PEX1-2:

- PCI Express 1.0a compliant.
- Maximum bandwidth is up to 250MB/s per direction.



Xtreme Graphics Port Slot: XGP1

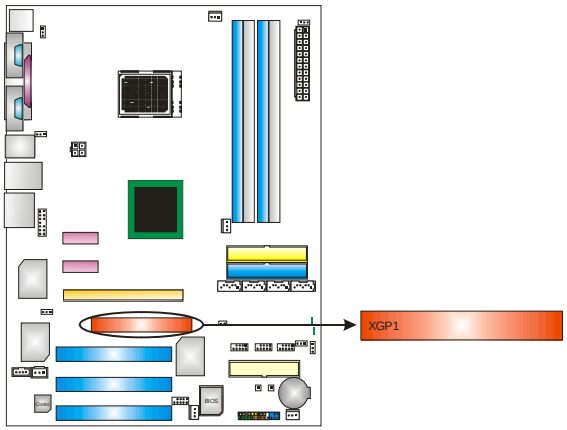
This XGP (Xtreme Graphics Port) slot is a special design that only supports compatible AGP VGA cards.

To install the system with an add-on AGP VGA card, please make sure to install the driver of add-on AGP VGA card before onboard VGA driver installation. If the onboard VGA driver has already been installed before you install the add-on AGP VGA card, the system will automatically set the onboard VGA as the primary graphics adapter.

If the onboard VGA driver can't be removed completely, and to solve this problem, please follow the steps below:

1. Disable onboard VGA utility under the operating system, and reboot PC. After PC restarts, the system will automatically set the AGP VGA card as the graphics adapter.
2. Re-install your operating system to ensure the AGP VGA card function can be used.

Note:
Please go to "http://www.biostar.com.tw" for more detailed information about XGP compatible AGP cards.



B. Connectors and Headers:

How to setup Jumpers

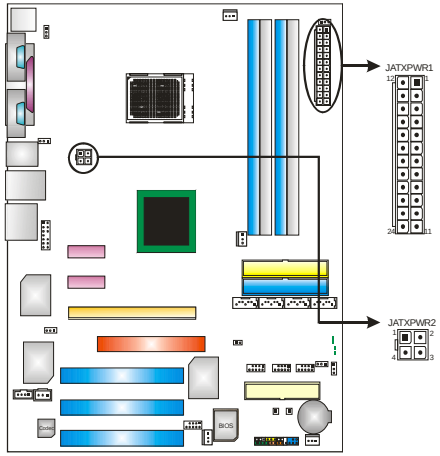
The illustration shows how to set up jumpers. When the jumper cap is placed on pins, the jumper is "closed", if not, that means the jumper is "open".

Pin opened Pin closed Pin1-2 closed

ATX Power Source Connectors: JATXPWR1/JATXPWR2

JATXPWR1 allows user to connect 24-pin power connector on the ATX power supply.

By connecting JATXPWR2, it will provide +12V to CPU power circuit.



JATXPWR1:

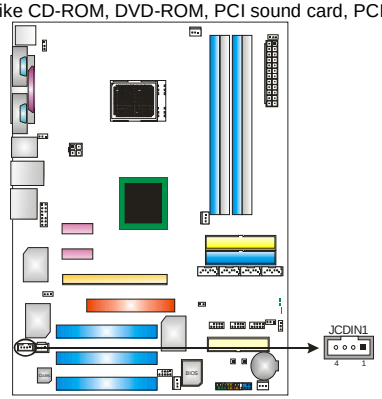
Pin	Assignment
1	+3.3V
2	+3.3V
3	Ground
4	+5V
5	Ground
6	+5V
7	Ground
8	PW_OK
9	Standby Voltage+5V
10	+12V
11	+12V
12	Detect
13	+3.3V
14	-12V
15	Ground
16	PS_ON
17	Ground
18	Ground
19	Ground
20	-5V
21	+5V
22	+5V
23	+5V
24	Ground

JATXPWR2:

Pin	Assignment
1	+12V
2	+12V
3	Ground
4	Ground

CD-ROM Audio-in Connector: JCDIN1

This connector allows user to connect the audio source from a variety of devices, like CD-ROM, DVD-ROM, PCI sound card, PCI TV tuner card etc..



Pin	Assignment
1	Left channel input
2	Ground
3	Ground
4	Right channel input

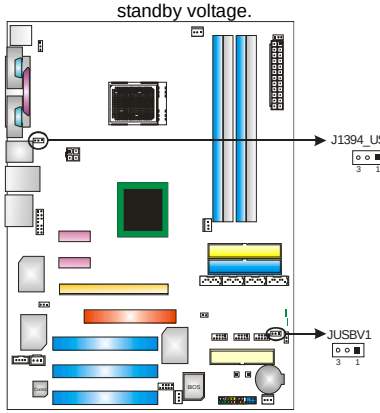
Power Source Headers for USB Ports: J1394_USBV1/JUSBV1

Pin 1-2 Close:

J1394_USBV1: +5V for USB ports at J1394_USB1 and JUSBLAN1.
JUSBV1: +5V for front USB headers (JUSB1/JUSB2/JUSB3).

Pin 2-3 Close:

J1394_USBV1: USB ports at J1394_USB1 and JUSBLAN1 are powered with +5V standby voltage.
JUSBV1: Front USB headers (JUSB1/JUSB2/JUSB3) are powered with +5V standby voltage.



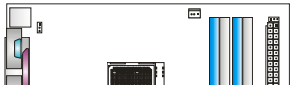
Pin 1-2 Close

Pin 2-3 Close

Note:
In order to support this function "Power-on system via USB device,"
"J1394_USBV1/JUSBV1" jumper cap should be placed on Pin 2-3 individually.

Headers for USB Ports at Front Panel: JUSB1~JUSB3

This connector allows user to connect additional USB cables at PC front panel, and also can be connected with internal USB devices, like USB card reader.

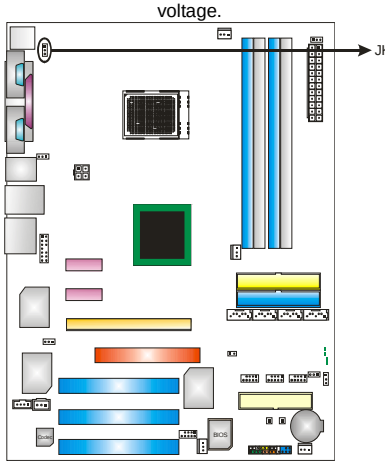


Pin	Assignment
1	+5V (fused)
2	+5V (fused)
3	USB-
4	USB-
5	USB+
6	USB+
7	Ground
8	Ground
9	Key
10	NC

Power Source Header for PS/2 Keyboard/Mouse: JKBMSV1

Pin 1-2 Close: +5V for PS/2 keyboard and mouse..

Pin 2-3 Close: PS/2 keyboard and mouse are powered with +5V standby voltage.



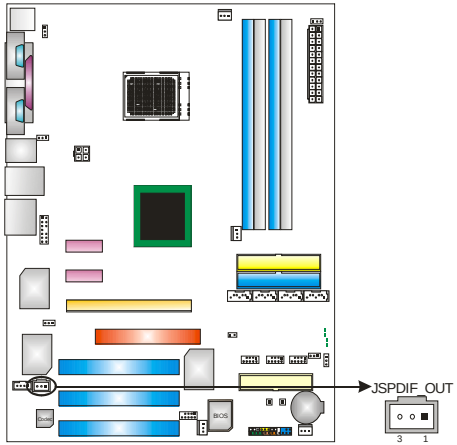
Pin 1-2 close

Pin 2-3 close

Note: In order to support this function "Power-on system via keyboard and mouse", "JKBMSV1" jumper cap should be placed on Pin 2-3.

Digital Audio-out Connector: JSPDIF_OUT

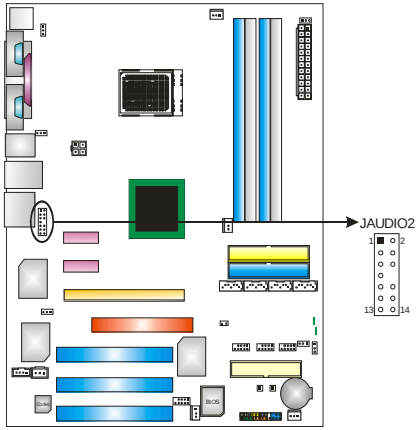
This connector allows users to connect the PCI bracket SPDIF output header.



Pin	Assignment
1	+5V
2	SPDIF OUT
3	Ground

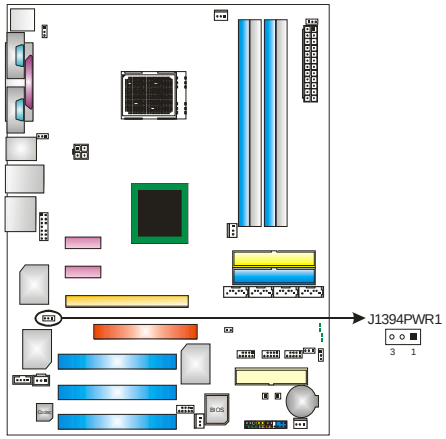
Front Panel Audio-out Header: JAUDIO2

This connector will allow user to connect with the front audio output headers on the PC case. It will disable the output on back panel audio connectors.



Pin	Assignment
1	MIC-in/ Stereo MIC-in R
2	Ground
3	Stereo MIC-in L
4	Audio power
5	Right line-out/ Speaker-out Right.
6	Right line-out/ Speaker-out Right
7	Reserved
8	Key
9	Left line-out/ Speaker-out Left
10	Left line-out/ Speaker-out Left
11	Right line-in (optional)
12	Right line-in (optional)
13	Left line-in (optional)
14	Left line-in (optional)

Power Source Header for 1394 Chip: J1394PWR1

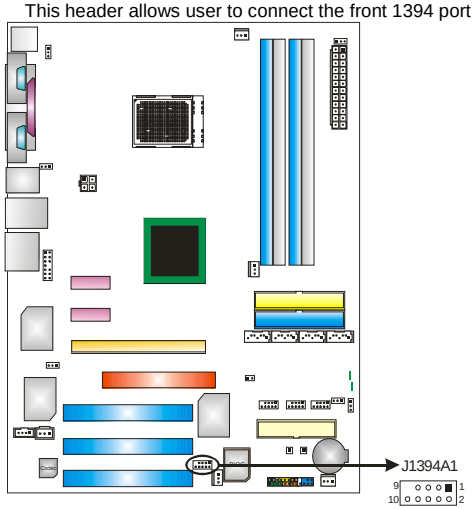


Pin 1-2 Close:
+3.3V for 1394 chipset (default).

Pin 2-3 Close:
+3.3V SB for 1394 chipset.

Header for 1394A Firewire Port at Front Panel: J1394A1

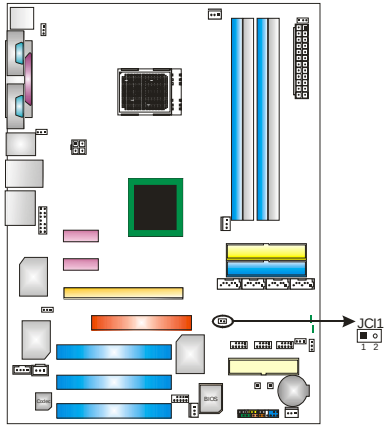
This header allows user to connect the front 1394 port for digital image devices.



Pin	Assignment
1	A+
2	A-
3	Ground
4	Ground
5	B+
6	B-
7	+12v
8	+12V
9	Key
10	Ground

Case Open Header: JCI1

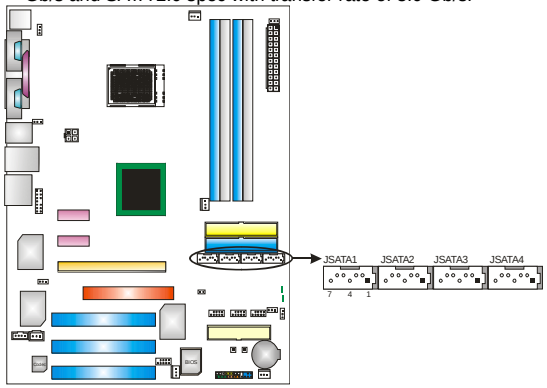
This connector allows system to monitor PC case open status. If the signal has been triggered, it will record to the CMOS and show the message on next boot-up.



Pin	Assignment
1	Case open signal
2	Ground

Serial ATA Connectors: JSATA1~JSATA4

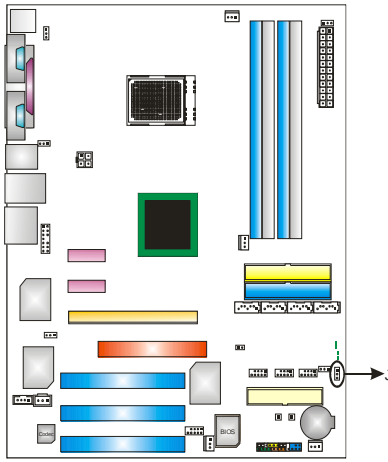
The motherboard has an SATA Controller in nForce4 CK8-04 and CK8-04 Ultra with 4 channels SATA interface, it satisfies the SATA 1.0 with transfer rate of 1.5 Gb/s and SATA 2.0 spec with transfer rate of 3.0 Gb/s.



Pin	Assignment
1	Ground
2	TX+
3	TX-
4	Ground
5	RX-
6	RX+
7	Ground

Clear CMOS Header: JCMOS1

By placing the jumper on pin 2-3, it allows user to restore the BIOS safe setting and the CMOS data, please carefully follow the procedures to avoid damaging the motherboard.



Pin 1-2 close:
Normal Operation (Default).

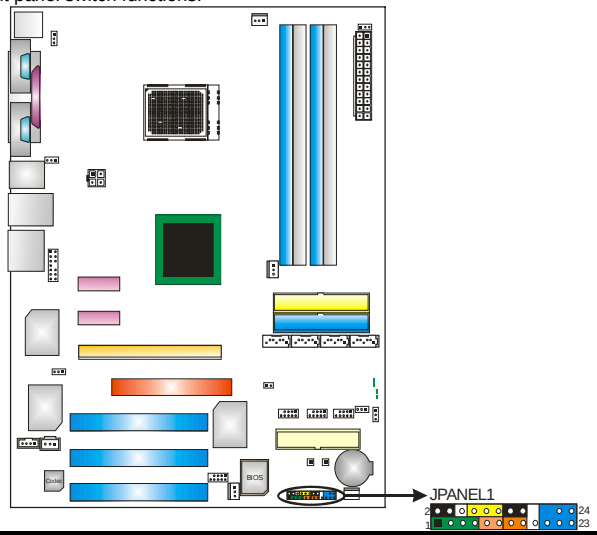
Pin 2-3 close:
Clear CMOS data.

※ Clear CMOS Procedures:

1. Remove AC power line.
2. Set the jumper to “Pin 2-3 close”.
3. Wait for five seconds.
4. Set the jumper to “Pin 1-2 close”.
5. Power on the AC.
6. Reset your desired password or clear the CMOS data.

JPANEL1: Header for Front Panel Facilities

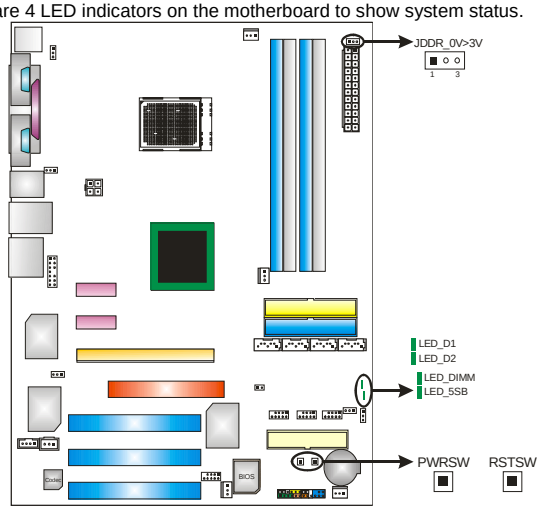
This 24-pin connector includes Power-on, Reset, HDD LED, Power LED, Sleep button, speaker and IrDA Connection. It allows user to connect the PC case's front panel switch functions.



Pin	Assignment	Function	Pin	Assignment	Function
1	+5V	Speaker Connector	2	Sleep control	Sleep button
3	N/A		4	Ground	
5	N/A		6	N/A	N/A
7	Speaker		8	Power LED (+)	Power LED
9	HDD LED (+)	Hard drive LED	10	Power LED (+)	
11	HDD LED (-)		12	Power LED (-)	
13	Ground	Reset button	14	Power button	Power-on button
15	Reset control		16	Ground	
17	N/A		18	Key	
19	N/A	IrDA Connector	20	Key	IrDA Connector
21	+5V		22	Ground	
23	IRTX		24	IRRX	

LED Indicators and Buttons

There are 4 LED indicators on the motherboard to show system status.



JDDR_0V>3V:

When processing memory voltage overclocking, please place the jumper to pin1-2 closed. The default setting is pin2-3 closed.

LED_D1 and LED_D2:

These 2 LED indicate system power on diagnostics.
Please refer to the table below for different messages:

LED_D1	LED_D2	Message
ON	ON	Normal
ON	OFF	Memory Error
OFF	ON	VGA Error
OFF	OFF	CPU / Chipset Error

LED_DIMM:

This LED indicates the voltage of memory is activated normally.

LED_5SB:

This LED indicates the system is ready for Power-on.

PWRSW:

This is an on-board Power Switch button.

RSTSW:

This is an on-board Reset button.

Chapter 3: NVIDIA RAID Functions

3.1 OPERATION SYSTEM

λ Supports Windows XP Home/Professional Edition, and Windows 2000 Professional.

3.2 RAID ARRAYS

NVRAID supports the following types of RAID arrays:

RAID 0: RAID 0 defines a disk striping scheme that improves disk read and write times for many applications.

RAID 1: RAID 1 defines techniques for mirroring data.

RAID 0+1: RAID 0+1 combines the techniques used in RAID 0 and RAID 1.

Spanning (JBOD): JBOD provides a method for combining drives of different sizes in to one large disk.

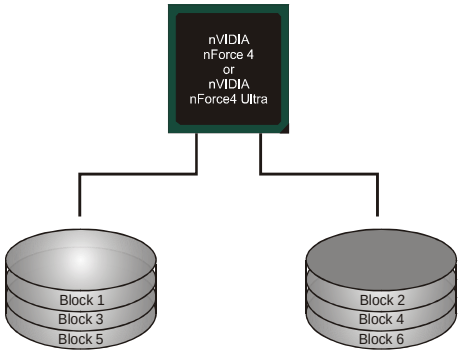
3.3 HOW RAID WORKS

RAID 0:

The controller "stripes" data across multiple drives in a RAID 0 array system. It breaks up a large file into smaller blocks and performs disk reads and writes across multiple drives in parallel. The size of each block is determined by the stripe size parameter, which you set during the creation of the RAID set based on the system environment. This technique reduces overall disk access time and offers high bandwidth.

Features and Benefits

- ***Drives:*** Minimum 1, and maximum is up to 6 or 8. Depending on the platform.
- ***Uses:*** Intended for non-critical data requiring high data throughput, or any environment that does not require fault tolerance.
- ***Benefits:*** provides increased data throughput, especially for large files. No capacity loss penalty for parity.
- ***Drawbacks:*** Does not deliver any fault tolerance. If any drive in the array fails, all data is lost.
- ***Fault Tolerance:*** No.



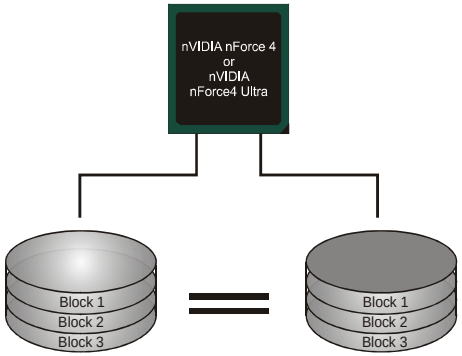
RAID 1:

Every read and write is actually carried out in parallel across 2 disk drives in a RAID 1 array system. The mirrored (backup) copy of the data can reside on the same disk or on a second redundant drive in the array. RAID 1 provides a hot-standby copy of data if the active volume or drive is corrupted or becomes unavailable because of a hardware failure.

RAID techniques can be applied for high-availability solutions, or as a form of automatic backup that eliminates tedious manual backups to more expensive and less reliable media.

Features and Benefits

- ***Drives:*** Minimum 2, and maximum is 2.
- ***Uses:*** RAID 1 is ideal for small databases or any other application that requires fault tolerance and minimal capacity.
- ***Benefits:*** Provides 100% data redundancy. Should one drive fail, the controller switches to the other drive.
- ***Drawbacks:*** Requires 2 drives for the storage space of one drive. Performance is impaired during drive rebuilds.
- ***Fault Tolerance:*** Yes.

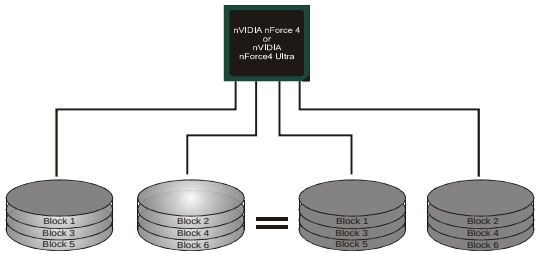


RAID 0+1:

RAID 0 drives can be mirrored using RAID 1 techniques. Resulting in a RAID 0+1 solution for improved performance plus resiliency.

Features and Benefits

- ***Drives:*** Minimum 4, and maximum is 6 or 8, depending on the platform.
- ***Benefits:*** Optimizes for both fault tolerance and performance, allowing for automatic redundancy. May be simultaneously used with other RAID levels in an array, and allows for spare disks.
- ***Drawbacks:*** Requires twice the available disk space for data redundancy, the same as RAID level 1.
- ***Fault Tolerance:*** Yes.

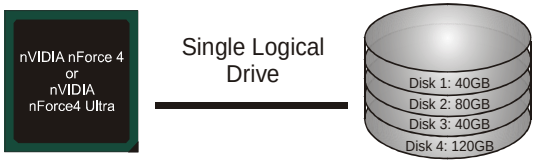


Spanning (JBOD):

JBOD stands for "Just a Bunch of Disks". Each drive is accessed as if it were on a standard SCSI host bus adapter. This is useful when a single drive configuration is needed, but it offers no speed improvement or fault tolerance.

Features and Benefits

- ***Uses:*** JBOD works best if you have odd sized drives and you want to combine them to make one big drive.
- ***Benefits:*** JBOD provides the ability to combine odd size drives using all of the capacity of the drives.
- ***Drawbacks:*** Decreases performance because of the difficulty in using drives concurrently.
- ***Fault Tolerance:*** Yes.



※ **For more detailed setup information, please refer to the Driver CD, or go to http://www.nvidia.com/page/pg_20011106217193.html to download NVIDIA nForce Tutorial Flash.**

CHAPTER 4: USEFUL HELP

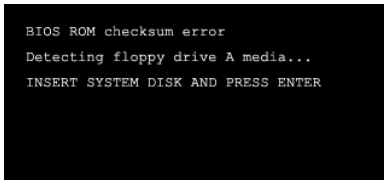
4.1 AWARD BIOS BEEP CODE

Beep Sound	Meaning
One long beep followed by two short beeps	Video card not found or video card memory bad
High-low siren sound	CPU overheated System will shut down automatically
One Short beep when system boots-up	No error found during POST
Long beeps every other second	No DRAM detected or installed

4.2 EXTRA INFORMATION

A. BIOS Update

After you fail to update BIOS or BIOS is invaded by a virus, the Boot-Block function will help to restore BIOS. If the following message is shown after boot-up of the system, it means the BIOS contents are corrupted.



In this case, please follow the procedure below to restore the BIOS:

1. Make a bootable floppy disk.
2. Download the Flash Utility "AWDFLASH.exe" from the Biostar website: www.biostar.com.tw
3. Confirm motherboard model and download the respective BIOS from Biostar website.
4. Copy "AWDFLASH.exe" and respective BIOS onto floppy disk.
5. Insert the bootable disk into floppy drive and press Enter.
6. System will boot-up to DOS prompt.
7. Type *"Awdflash xxxx.bf/sn/py/r"* in DOS prompt.
8. System will update BIOS automatically and restart.
9. The BIOS has been recovered and will work properly.

B. CPU Overheated

If the system shuts down automatically after power on of system for a few seconds that means the CPU protection function has been activated.

When the CPU is over heated, the motherboard will shutdown automatically to avoid damaging the CPU, and the system will not power on again.

In this case, please double check:

1. The CPU cooler surface is placed evenly with the CPU surface.
2. CPU fan is rotating normally.
3. CPU fan speed is fulfilling the CPU speed.

After confirmation, please follow the steps below to relieve the CPU protection function.

1. Remove the power cord from power supply for a few seconds.
2. Wait for a few seconds.
3. Plug in the power cord and boot up the system.

Or you can:

1. Clear the CMOS data.
   (See "JCMOS1: Clear CMOS Header" section)
2. Wait for a few seconds.
3. Power on the system again.

4.3 TROUBLESHOOTING

Problem	Solution
1. No power to the system at all Power light don't illuminate, fan inside power supply does not turn on. 2. Indicator light on keyboard does not turn on.	1. Make sure power cable is securely plugged in. 2. Replace cable. 3. Contact technical support.
System inoperative. Keyboard lights are on, power indicator lights are lit, and hard drive is spinning.	Using even pressure on both ends of the DIMM, press down firmly until the module snaps into place.
System does not boot from hard disk drive, can be booted from optical drive.	1. Check cable running from disk to disk controller board. Make sure both ends are securely plugged in; check the drive type in the standard CMOS setup. 2. Backing up the hard drive is extremely important. All hard disks are capable of breaking down at any time.
System only boots from optical drive. Hard disk can be read and applications can be used but booting from hard disk is impossible.	1. Back up data and application files. 2. Reformat the hard drive. Re-install applications and data using backup disks.
Screen message says "Invalid Configuration" or "CMOS Failure."	Review system's equipment. Make sure correct information is in setup.
Cannot boot system after installing second hard drive.	1. Set master/slave jumpers correctly. 2. Run SETUP program and select correct drive types. Call the drive manufacturers for compatibility with other drives.

8/22, 2005